

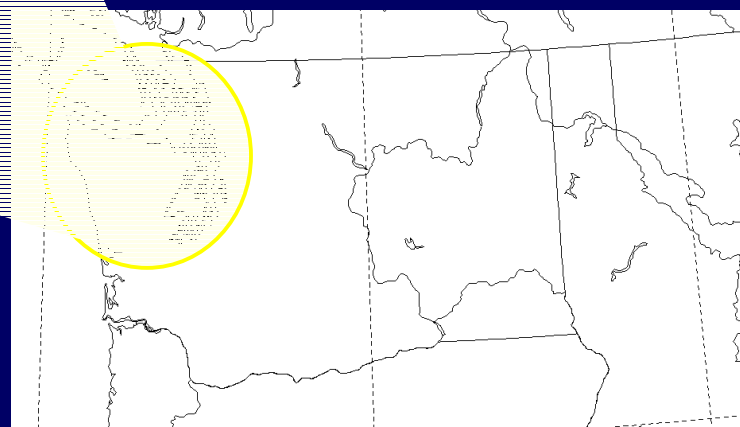


Puget Sound and Adjacent Waters Ecosystem Restoration Program

On-going Corps Programs within the Puget Sound Basin

Future Dedicated Puget Sound Program

The Nearshore Project





On-Going Corps Ecosystem Restoration Programs Within the Puget Sound Basin

- Restoration of Existing, Constructed Corps of Engineers Projects
(Section 1135 of WRDA 1986)
- Aquatic Restoration
(Section 206 of WRDA 1996)
- Planning Assistance to States
(Section 22, WRDA 1974)
- General Investigation Studies
(specific authorizations for individual projects)
- Support to Other Federal Agencies
(EPA, Navy, Forest Service, Park Service, Transportation)



Hamm Creek

- Section 1135
- Project Year: 2000
- 0.73 acres estuarine wetland, 2.98 acres adjacent upland, 1900 feet of stream bed and freshwater wetland adjacent upland.
- On-going Monitoring: USFWS – vegetation, bird use, fish presence. Corps – fish density, residency, growth rates.





Carpenter Lagoon Section 206

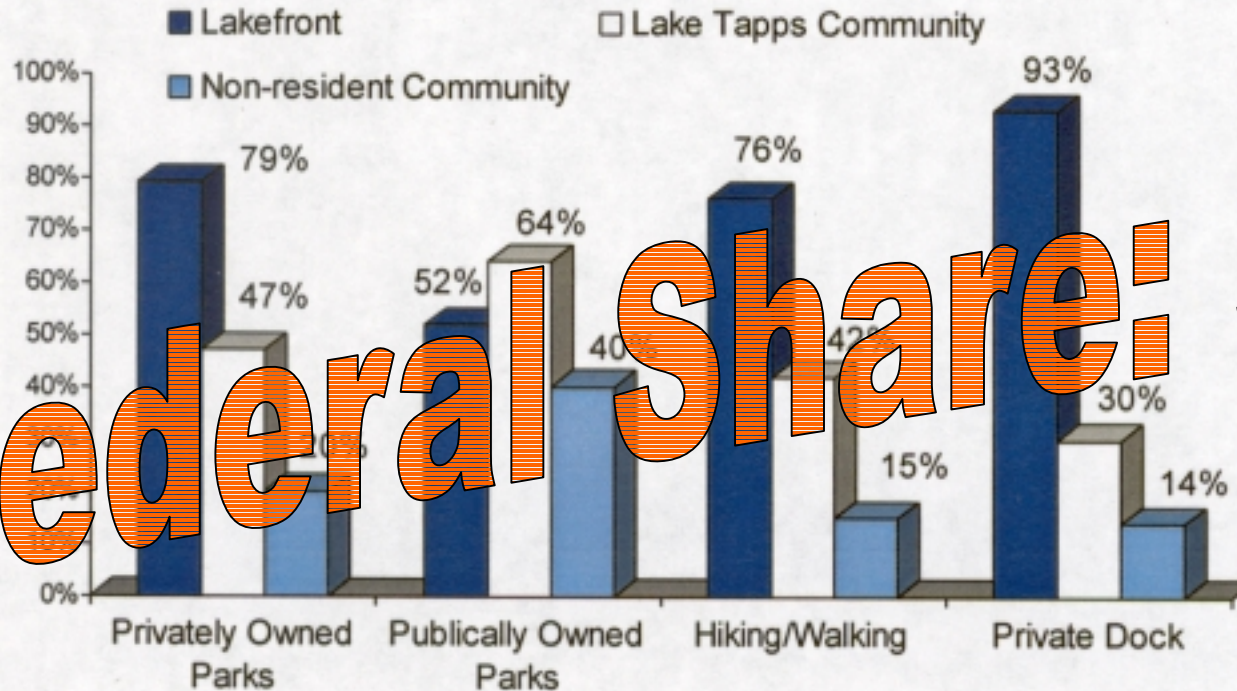
Local Sponsor – Kitsap County





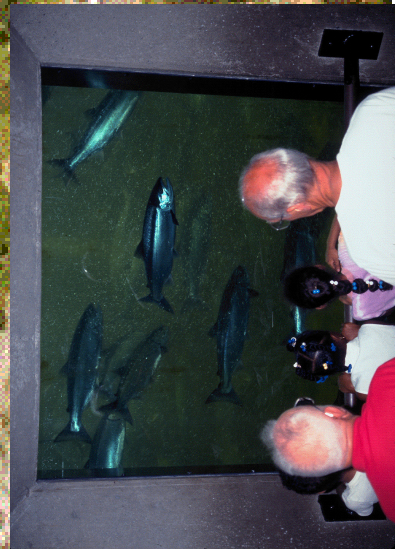
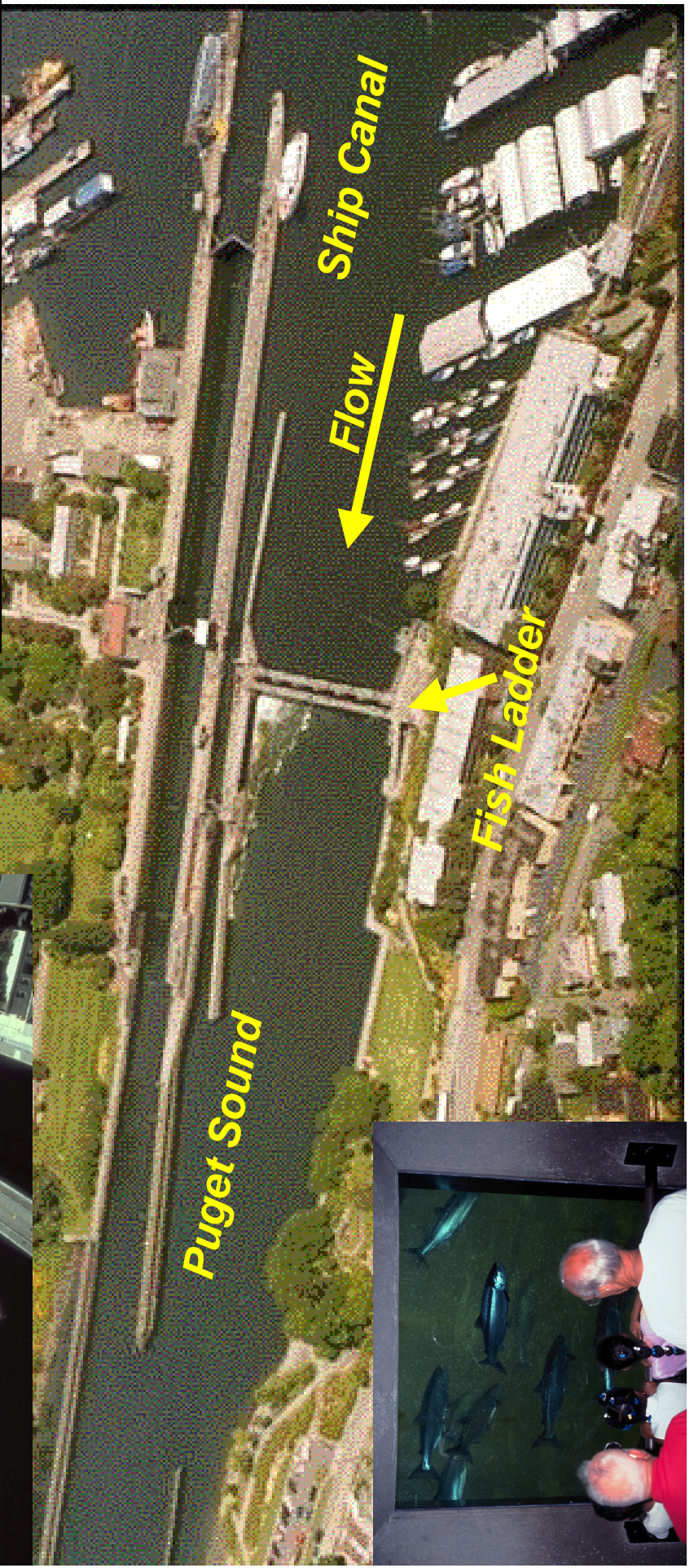
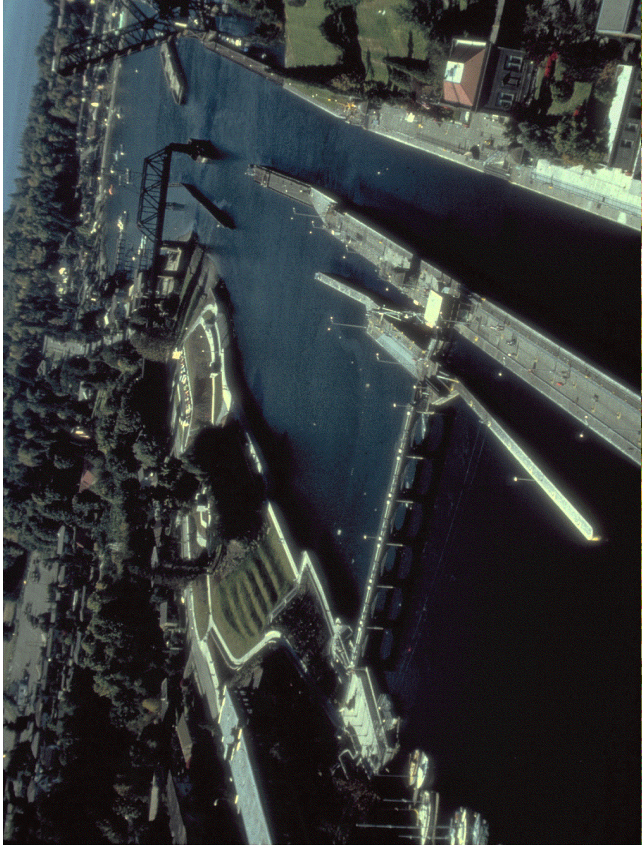
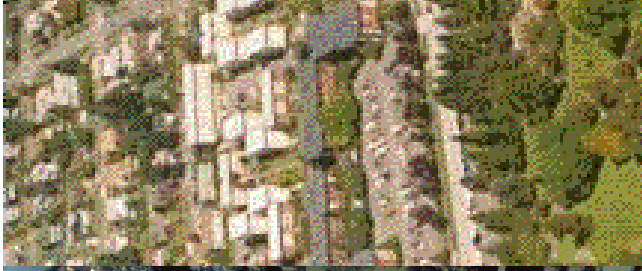
Planning Assistance To States

TABLE 1
LAKE TAPPS RECREATION USAGE
BY PROXIMITY



Federal Share: 50%

- Four in ten respondents (40%) say they use the lake either very often or quite a bit. Another 41% said they only use the lake occasionally, while 19% report never using the lake.
- When asked if they would use the lake more if it were available more months out of the year, overall, 47% said they would be likely to use the lake more. Of those who said they only use the lake occasionally, 37% said they would use it more if it were available more months of the year. Twelve percent of those who said they never use it reported that they would if it were open more months out of the year.



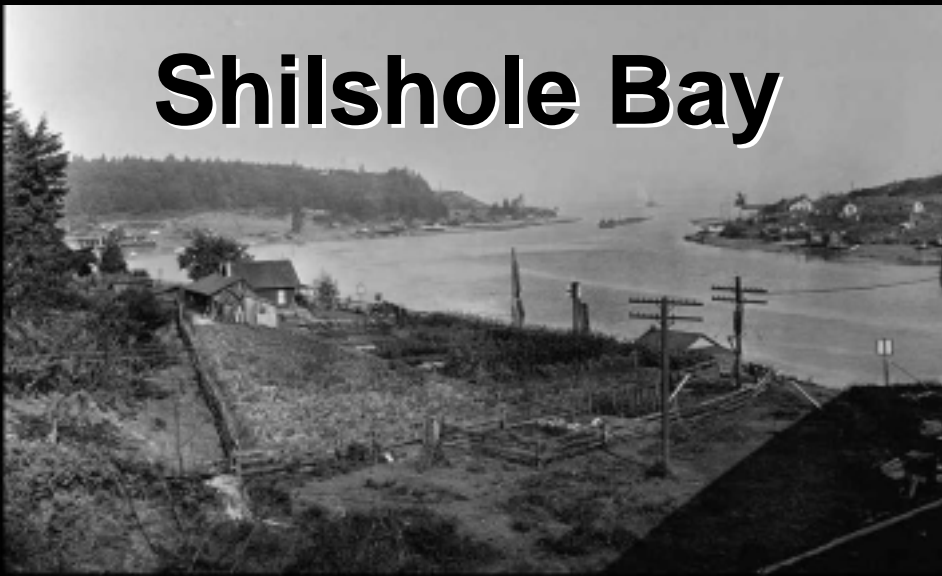


What about physical habitat restoration in the most heavily urbanized watershed in the PNW?

Lake Union



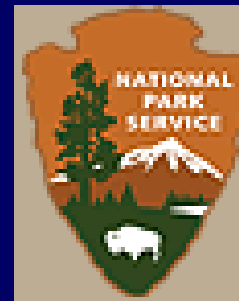
Shilshole Bay



- **Lake Union has been heavily developed for over 100 years. Toxin clean-up is ongoing. Predatory fish love the urban scene.**
- **Locks inundated Salmon Bay and eliminated 1300 acres of intertidal habitat.**
- **Shilshole Bay has very little undeveloped shoreline left.**
- **New tools promise better understanding of juvenile salmon's use of the available habitat.**



Support To Other Federal Agencies





Pacific Creosoting Company





Major Contaminants



- Creosote
- Polycyclic Aromatic Hydrocarbons (PAH)
- Pentachlorophenol (PCP)
- Mercury



Harbor Capping



Winter 2001

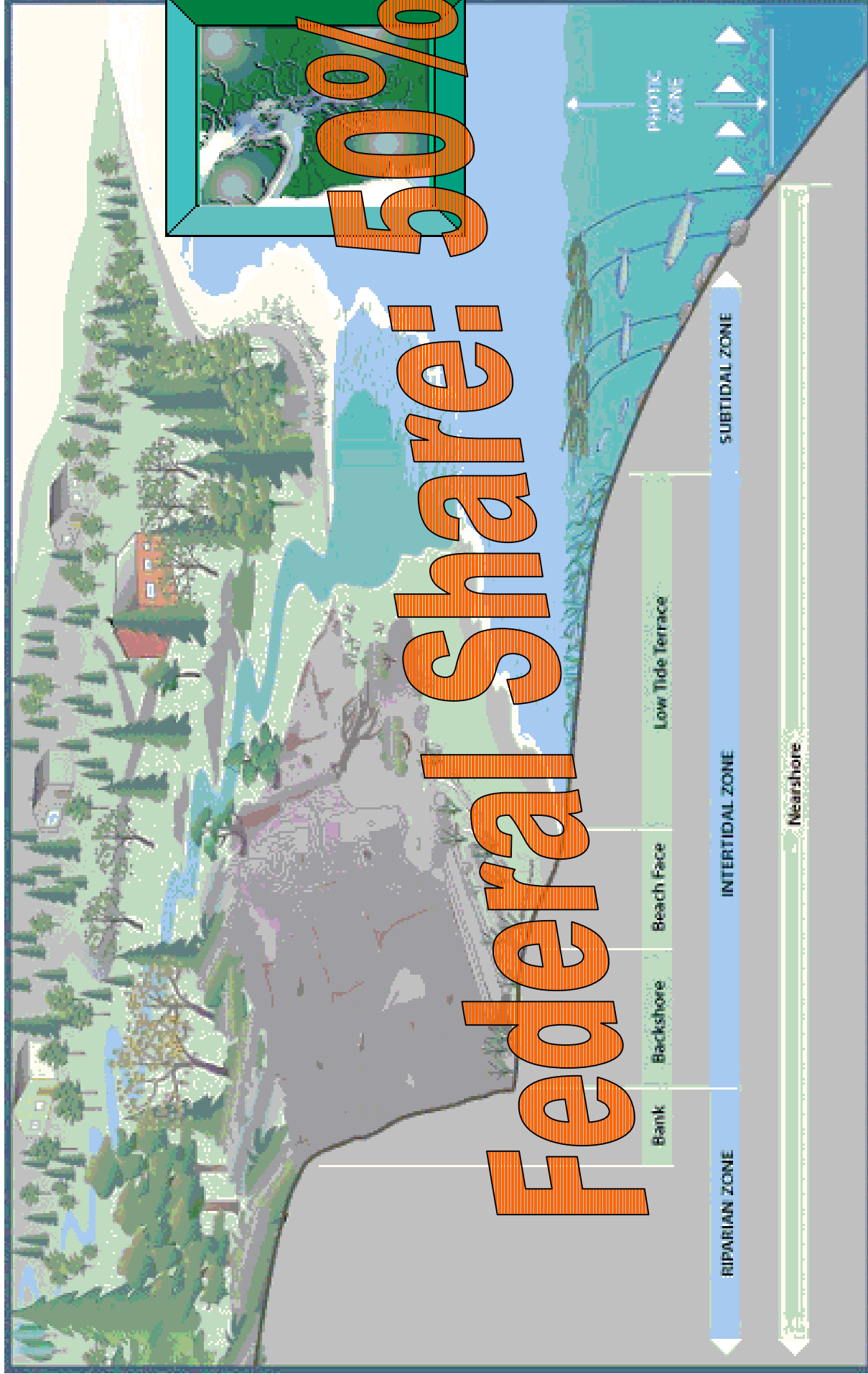


Puget Sound and Adjacent Waters

A New Application of a Long-Standing Authority

- Water Resource Development Act of 2000 authorizes ecosystem restoration within Puget Sound. (Section 544)
- Current status: Awaiting appropriation legislation of \$40M over five years, possible as early as FY08 with initially \$2M.
- Each restoration action limited to \$5M federal with local sponsor responsible for real-estate, operations, and maintenance.
- PSAW promises to be an early action delivery method... another tool to restore many sites.

Federal Share: 65%



Puget Sound Nearshore Project



Graphic courtesy of
King County



Puget Sound Nearshore Ecosystem Restoration Project

Objective

Restore nearshore habitat to benefit Puget Sound biota and restore the integrity of the ecosystem, including the functions and natural processes within the basin.





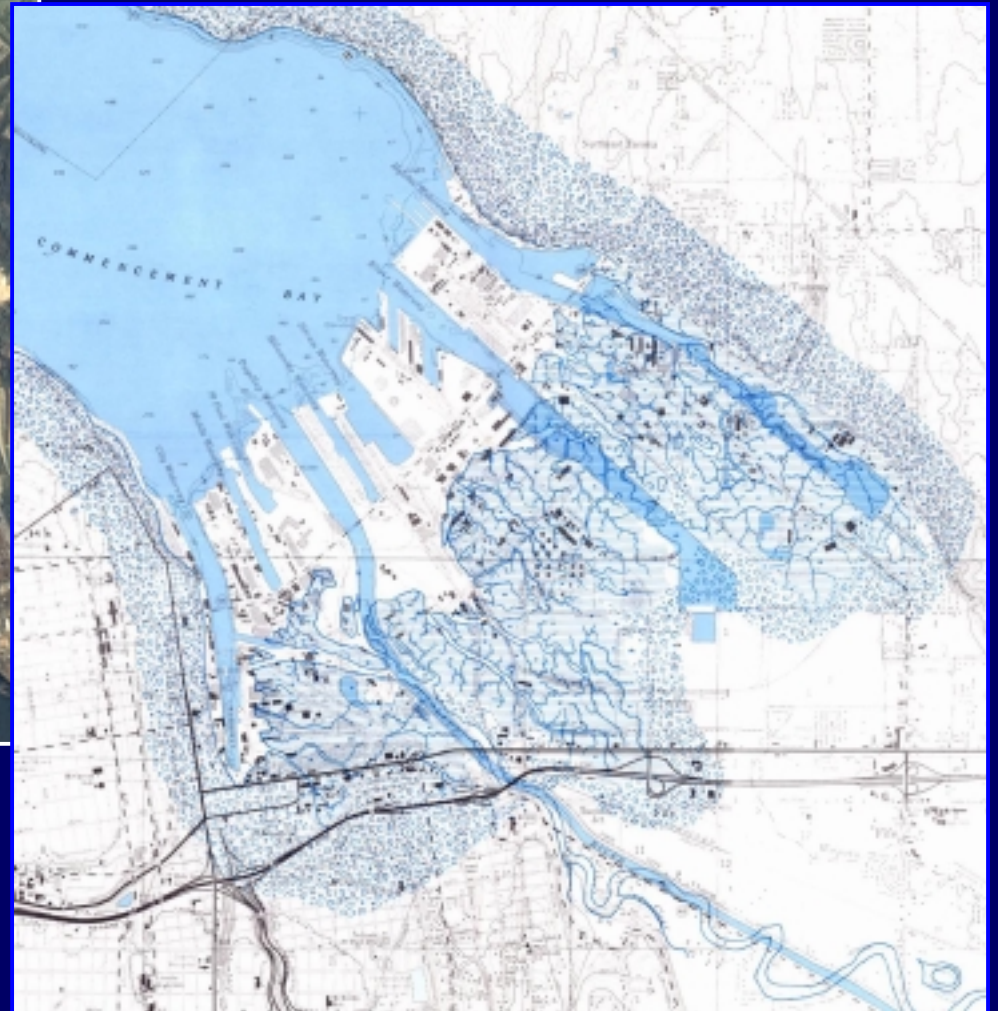
Puget Sound Nearshore Ecosystem Restoration Project

Why the Nearshore Project?

- Puget Sound is one of the fastest growing areas in the nation and under tremendous development pressure.
- Nine of ten species listed under ESA within western Washington inhabit the Puget Sound nearshore.
- Other fish and wildlife species in Puget Sound are on the brink.
- It is an opportunity to develop a sound scientific basis for identification of priority restoration and protection projects.
- It can improve the overall health of Puget Sound by changing the physical nature of degraded habitat.



Puyallup River and Commencement Bay, Tacoma





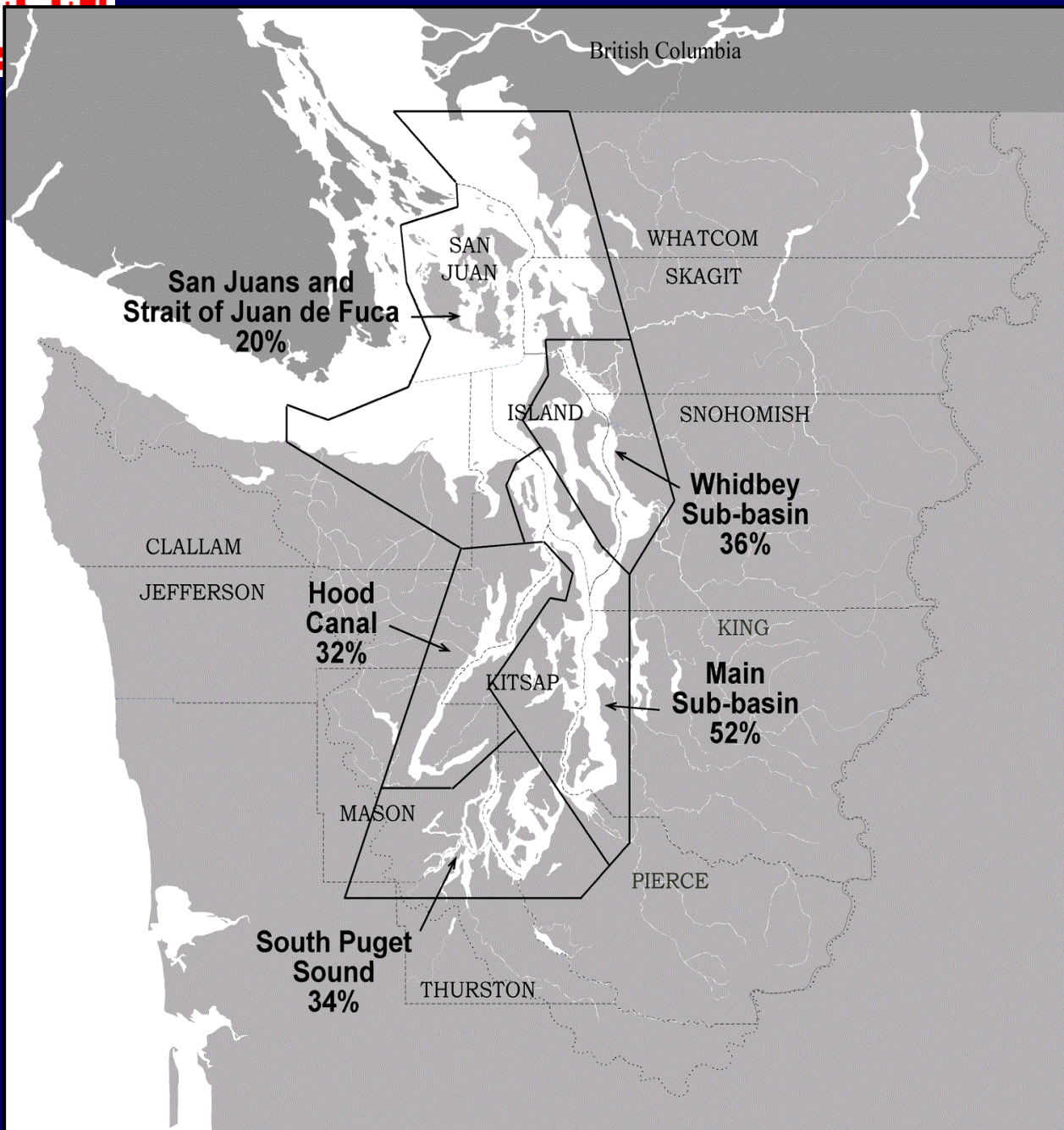
Federal Way, South King County



Impacts of Shoreline Armoring



- Loss of littoral sediment
- Wave reflection/scour
- Hydrological impacts
- Loss of riparian vegetation
- Passive erosion
- Cumulative impact

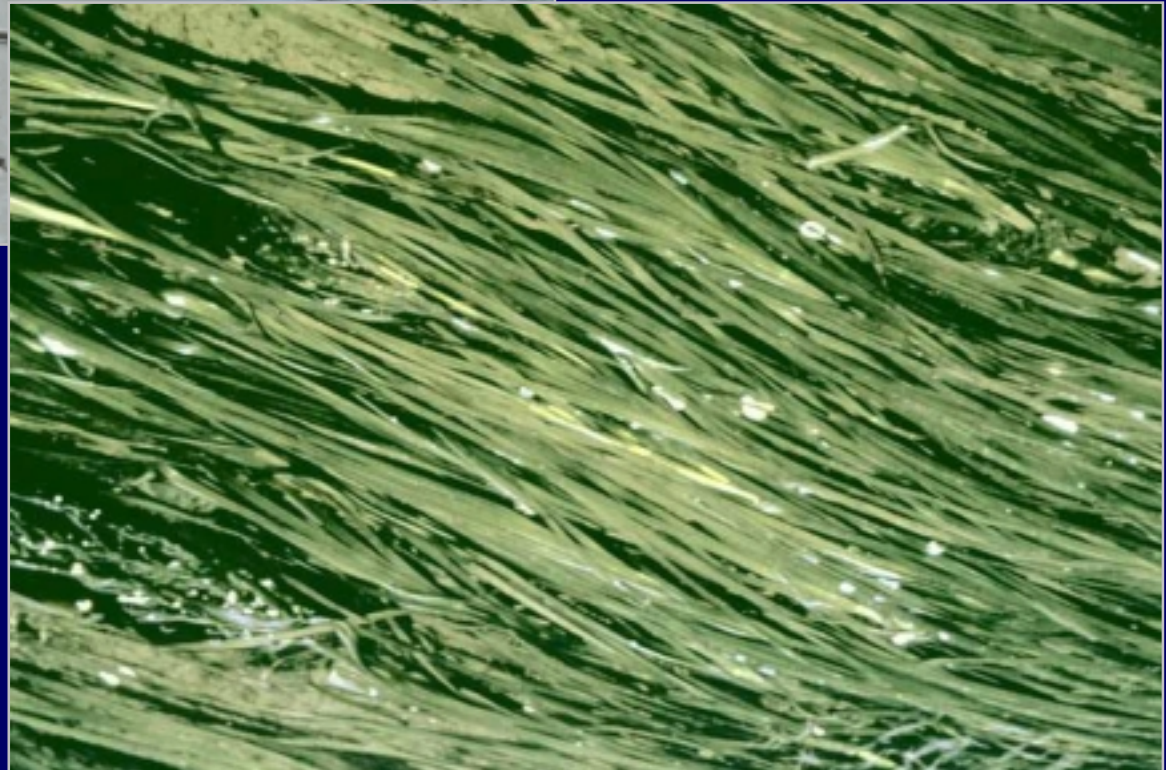


**Modified
shoreline on
Puget Sound**

[DNR, 1998]



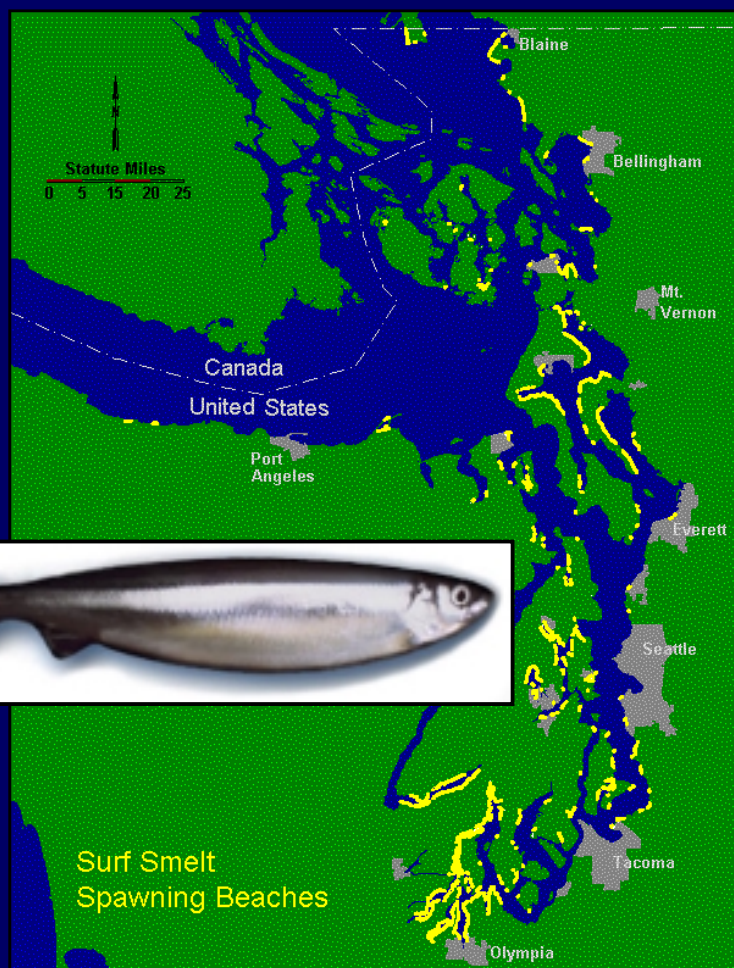
Eelgrass





Forage Fish

Surf Smelt Sand Lance





Puget Sound Nearshore Ecosystem Restoration Project

Project Phases

- Reconnaissance Study
- Assessment and Feasibility
- Engineering, Permitting, and Design
- Construction
- Monitoring and Maintenance



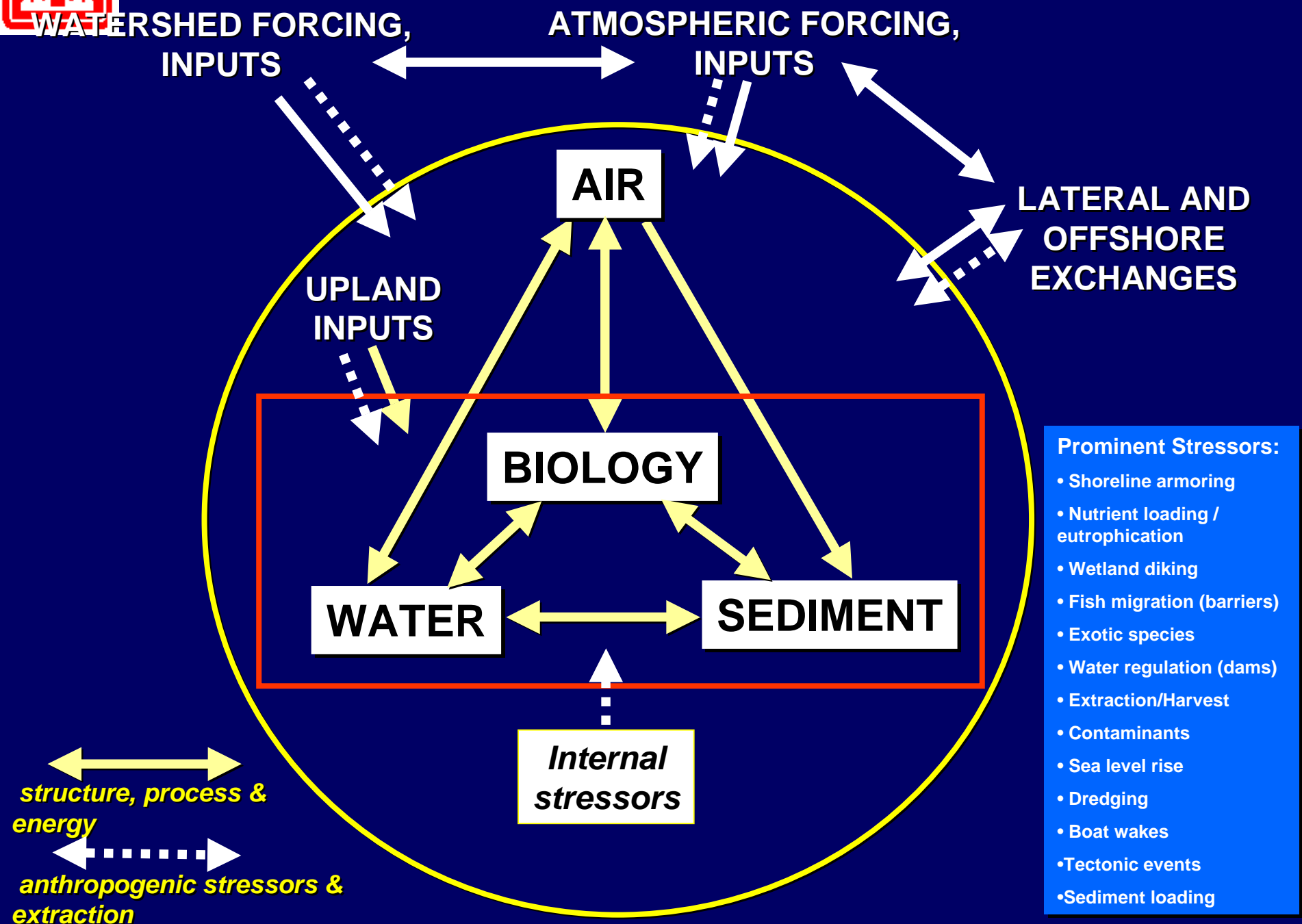
Questions

- What are the predictable relationships between geomorphological and hydrological processes, beach substrate, and biological community?
- How do geomorphological and hydrological processes affect landscape-scale ecological processes (e.g. migratory pathways, eelgrass patchiness)?
- How is biota impacted by changes in sediment supply, nutrients, or toxins within the nearshore.

**What can be done
to restore
the nearshore ecosystem?**

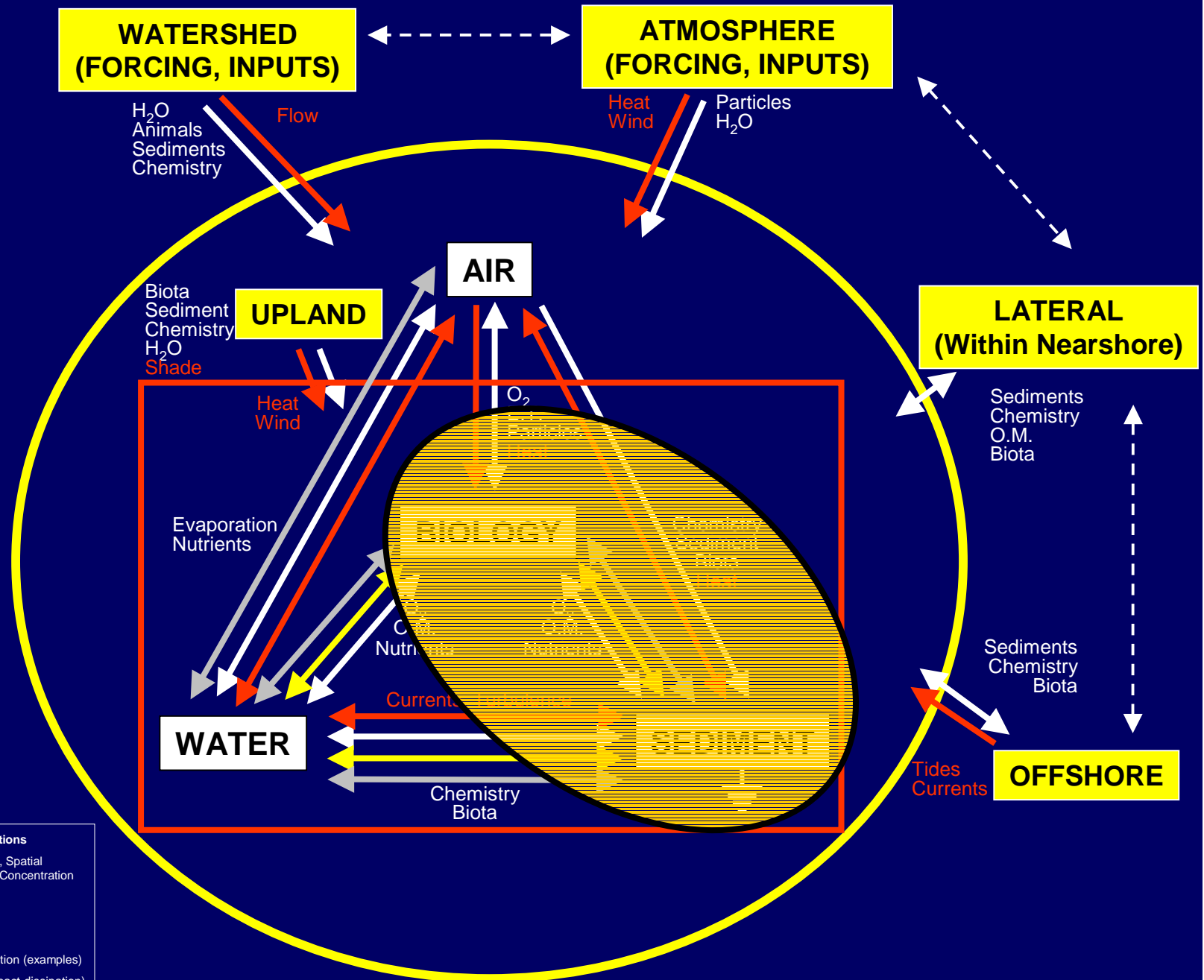


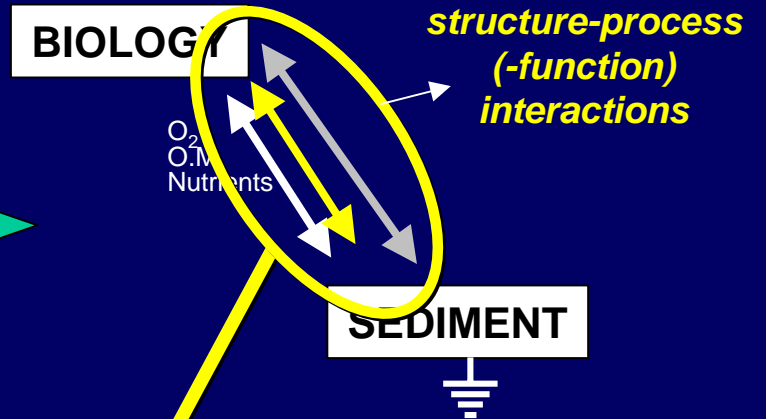
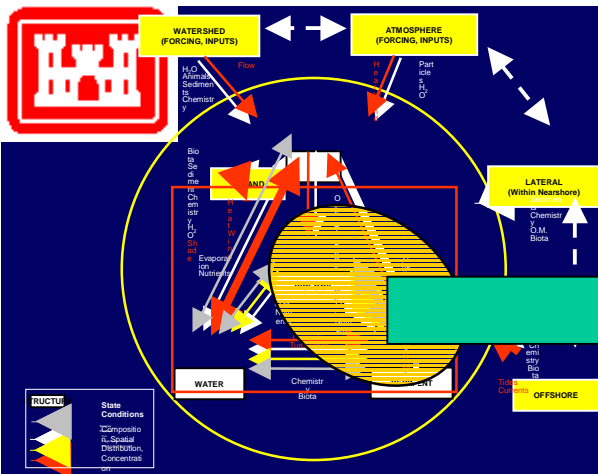
PSNERP Conceptual Model-Level 1 with stressors



Nearshore Puget Sound

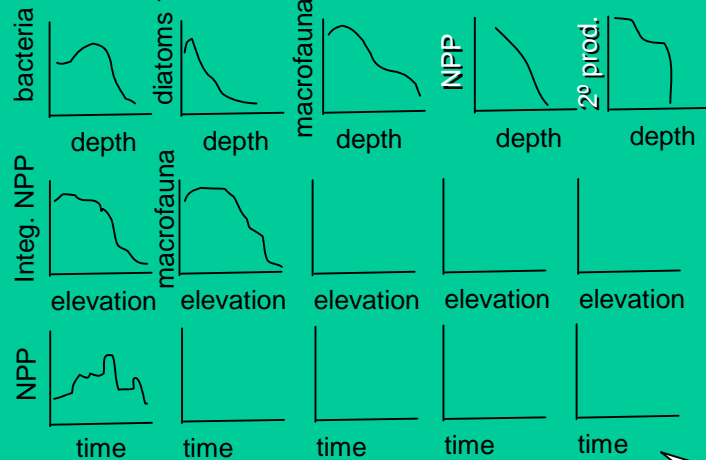
PSNERP Conceptual Model - Level 2.0



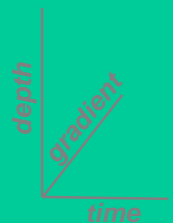
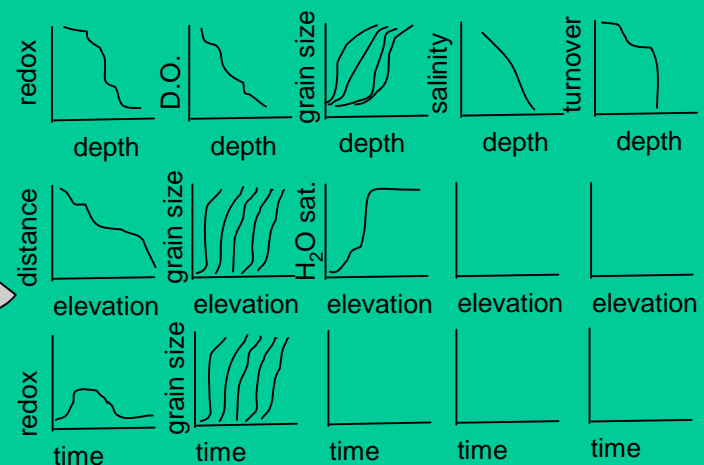


STRUCTURAL LINKAGES

VERTICAL, HORIZONTAL AND TIME STRUCTURE OF BIOLOGY



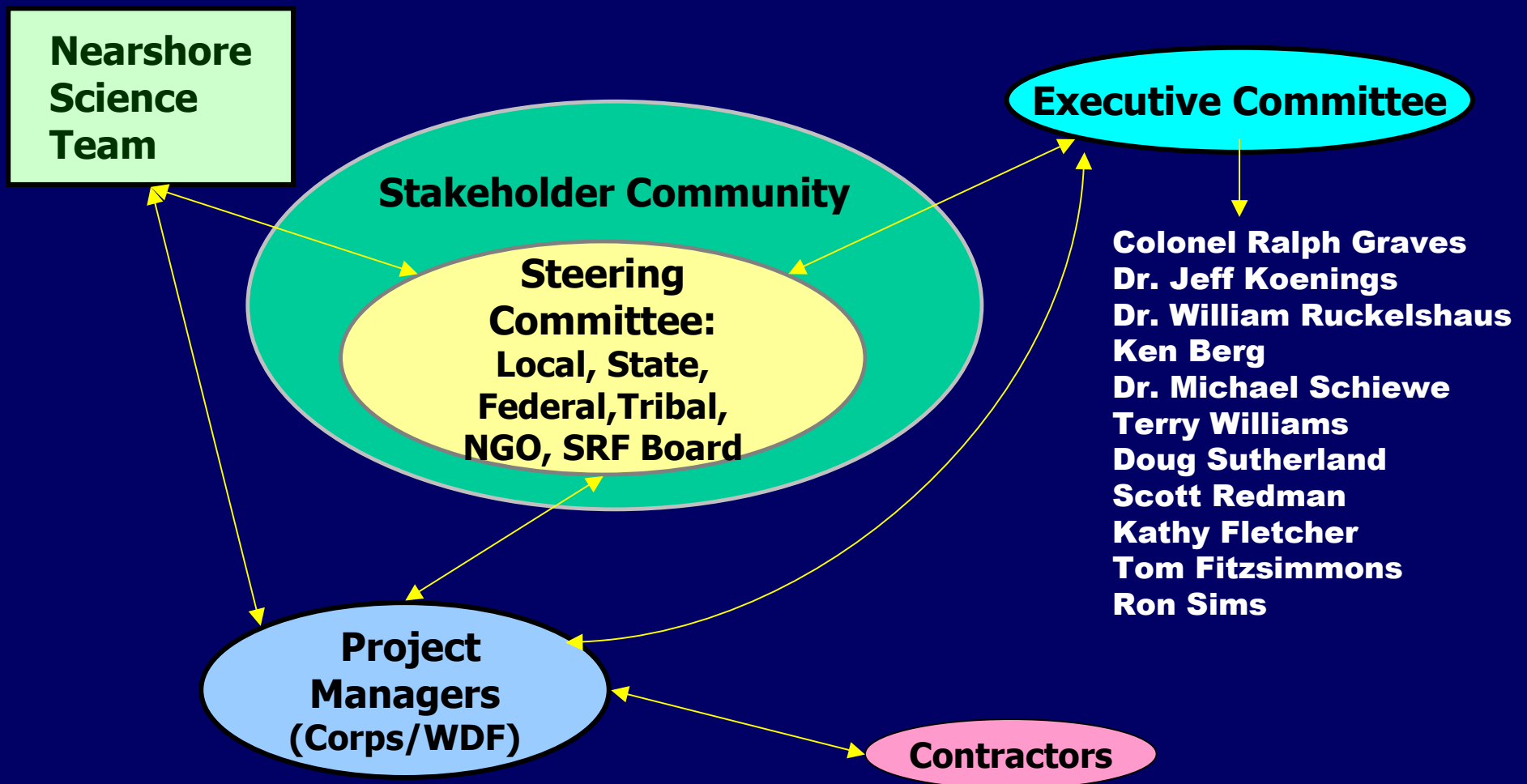
VERTICAL, HORIZONTAL AND TIME STRUCTURE OF SEDIMENTS





Puget Sound Nearshore Ecosystem Restoration Project

Structure





Puget Sound Nearshore Ecosystem Restoration Project

- A joint partnership of:
 - U.S. Army Corps of Engineers
 - Washington Department of Fish and Wildlife
 - Federal Agencies
 - Washington State Agencies
 - Tribes
 - Local Governments
 - Non-Governmental Organizations
 - Academia
 - Private Sector
 - Citizens



Summary

- **Further scientific understanding of the Puget Sound nearshore.**
- **Develop a model to help explain cause and effect relationships within the ecosystem.**
- **Develop feasible federal actions to restore and preserve – including actions by the Corps of Engineers -
- within the complex nearshore environment.**
- **Guide restoration and protection actions taken by local communities as they replace infrastructure, guide development, and teach citizens about the Puget Sound.**





Puget Sound and Adjacent Waters Ecosystem Restoration Program

